

health, vocational and independent-living agencies that can provide appropriate services. Additionally, repetitive depressive episodes, near suicides with mental or physical residuals and eating disorders all have the potential to significantly and permanently affect a young person's life before age 22 years and to qualify that person for services for developmental disability.

Resources

Less than half of the US childhood population regularly visits physicians for child health supervision activities after 36 months of age. This mandates a cooperative process between a child's physician, who has cumulative health and developmental information, and personnel from the child's school who screen and evaluate preschool and school-aged children under PL 94-142 regulations.

In addition, there remains a need for additional physician-initiated clinical activities to effectively screen older children, adolescent and young adult populations to ensure that all persons with developmental disabilities are not only identified but also adequately evaluated and provided with needed services.

But beyond the screening efforts, we need also to make efforts to integrate our medical services with community, state and federal programs that can contribute to the quality of life for patients with disabilities. We should not only be treating the medical problems of a child with spina bifida in our offices, but should also be working closely with school personnel to see that our recommendations for bladder management fit optimally with the child's normal activities and that the school personnel can carry out such recommendations. Does the adolescent we have seen after a suicide attempt have contact with community mental health and family support services, and how can we contribute to the ongoing efforts of those services? How can we steer a high school student with a degenerative neuromuscular disorder toward the vocational services that could help that patient toward a possible career?

This broad approach has not traditionally been within the scope of most clinical practices. In the case of disabling conditions, the awareness of nonmedical needs and resources to meet them is vital to a patient's well-being. For physicians, such integrative efforts offer a way to make the often great challenges of patients with chronic disabilities a shared and more rewarding responsibility.

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Ancient Sources of Lead and Lead Poisoning in the United States Today

LEAD IS ONE of the ancient metals. A lead statue in the British Museum discovered in Turkey dates from 6500 BC.¹ Lead has been mined, smelted and used in cosmetics, internal and topical medicinal preparations, paint pigments and glazes throughout the Old World since earliest recorded history.² Elsewhere in this issue, two recent cases of lead poisoning in children are presented—one due to azarcon, a Hispanic folk

remedy containing lead tetroxide, and the other due to the close proximity of the child's home to a secondary lead smelter. The physicians handling these cases are to be congratulated. Owing to the nonspecificity of the classic clinical manifestations of plumbism, its diagnosis has baffled physicians from antiquity² to recent times. Two recent baffling cases were traced to ancient uses of lead, namely, a lead-glazed ceramic mug³ and a lead-contaminated health food calcium dietary supplement.⁴ The definitive laboratory test for the diagnosis of lead poisoning is a whole blood lead test, which has become widely available only in the past decade. Within the past few months, the National Bureau of Standards has made available a certified standard reference material for blood lead analysis (SRM 955, available from the United States Department of Commerce, National Bureau of Standards, Washington, DC 20234) that should further improve the quality of blood lead data.

Lead-bearing ores often contain silver. Following the discovery about 4000 BC of cupellation, a simple process by which silver can be recovered from lead ores, lead was extensively mined throughout the Old World, mainly for its silver content. Nriagu² estimates that more than 40 million tons of lead had been produced by the time of the fall of Rome. Although the fact is not recorded, it is not unlikely that children near ancient lead mines and smelters were poisoned in a manner similar to that reported by Sawyer and colleagues. In this most recent case the physicians, having made the diagnosis, are to be congratulated in particular for having taken the next important step, namely, visiting the child's home to collect environmental samples to identify the child's source(s) of lead. It is this step, together with the reporting of index cases to public health authorities,⁵ that is essential to trigger an epidemiologic investigation, which in this case apparently led to closure of the smelter and evacuation of the heavily contaminated adjacent area. Similarly, an alert pediatrician trained in an eastern city where childhood plumbism is endemic recognized clinical plumbism in two children from Kellogg, Idaho, where he had gone to practice. He reported these cases which, in turn, resulted in the discovery of an epidemic of subclinical plumbism due to emissions from a large primary lead smelter in Kellogg.⁶

In addition to children who live near lead smelters, children (and other housemates) of lead workers who bring lead-bearing dust home on their work clothing are also at risk. Several clusters of such cases, particularly in relation to lead and asbestos, have been identified.⁷ These cases illustrate the need for physicians to take both environmental and occupational histories. All family members of index cases should be considered regardless of age, and cases should be reported so that appropriate epidemiologic investigations and public health action can be undertaken.

Ceruse (lead carbonate), litharge (lead monoxide) and other oxides of lead and galena (lead sulfide) have been used in the Old World throughout recorded history as cosmetics and basic ingredients in medicaments, nostrums and folk remedies.² Lead sulfide is still used today as a black eye cosmetic and is known on the Indian subcontinent as *surma* and in the Arabic world as *kohl*. Recently, severe cases of plumbism in children from both cosmetic⁸ and medicinal uses⁹ of lead sulfide have been reported. The Greco-Romans used lead carbonate and the oxides of lead primarily in topical medica-

tions and only to a limited extent in internal remedies. The ancient Chinese, however, used lead to a much greater extent in herbal medicines given internally.² Furthermore, these concoctions may contain arsenic, mercury or both.

Not surprisingly, some people who come to the United States from Asia, the Middle East and South America bring with them these ancient folk remedies, although they may be reluctant to admit it. For example, the Centers for Disease Control (CDC) have recently reported cases of both lead and arsenic poisoning among Hmong refugees in the United States due to or suspected of being due to imported folk remedies.^{10,11} Hmong people residing in the United States are concentrated mainly in San Diego, Fresno and Stockton, California, and Minneapolis.¹⁰ Cases of plumbism due to both Indian¹² and Chinese¹³ folk remedies have been identified in the West within the past decade. Preparations containing lead, arsenic or mercury are used in folk medicine, not only as remedies for such complaints as *empacho*, fever and rash, but also as tonics and salves.

While one of the cases reported elsewhere in this issue was due to lead tetroxide (azarcon, also known as *greta*), recent surveillance by the CDC makes it clear that we must extend our horizons beyond Mexico to include immigrants from all parts of Asia. Our horizons must also be extended by the realization that arsenic and mercury may also be present in such folk remedies. It is only 40 years since arsenicals were replaced by penicillin in the treatment of syphilis in the western world. Perhsgen's observation that arsenicals could be found in Belgium in over-the-counter medications as late as 1978 should make the traveler wary.¹⁴ These events present a considerable challenge to physicians and allied health professionals working in concert with leaders of ethnic groups newly arrived in the US, if deeply engrained ancient but dangerous cultural practices are to be changed.

Tetraethyl lead was discovered in the United States by Thomas Midgely in 1921, added to gasoline in 1923 and raised a public health controversy from the very beginning.¹⁵ After the intense public scrutiny of the past 15 years, it appears that this most recent source of widespread low-level environmental contamination by lead will shortly end. The US Environmental Protection Agency has ruled that the lead content of gasoline be reduced to 0.1 grams per gallon by 1 January 1986 and has proposed a complete ban as early as 1988.¹⁶ This is likely to leave lead paint, another ancient use of lead, as the major lead-related public health problem in the United States, particularly in the older housing in the East and the Midwest.¹⁷ Not only are poor children in deteriorated old housing still at risk, but so also are urban homesteaders who renovate old housing.¹⁸ Although it is well known that virtually all housing built in the United States before 1940 contained lead pigment paints, it may not be appreciated that approximately 20% of housing built between 1960 and 1975 contains potentially hazardous amounts of lead on exposed interior surfaces.¹⁹ The distribution of paint containing lead additives (driers and pigments) intended for exposed interior and exterior residential surfaces was finally banned in interstate commerce by the Consumer Products Safety Commis-

sion in September 1977.²⁰ Decades may pass before lead-painted housing is either replaced or totally renovated. Thus, the ancient causes of serious and even fatal lead poisoning—paint, folk remedies and tonics, cosmetics and dangerous lead trades such as lead smelting—remain with us, while one of the most recent discoveries—tetraethyl and tetramethyl lead—departs the scene after a brief stay of about 70 years. Lead is a versatile metal with many uses. This makes it incumbent upon physicians to consider the many possible sources of exposure for a given child²¹ and to initiate the environmental investigation necessary to identify the source(s). Reducing or eliminating the source is the cornerstone of therapy for lead poisoning. Primary prevention is, of course, the long-term goal.

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